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storytold / **photocraft**

Code | Issues 1.7k | Pull requests 1.1k | Actions | Projects | Security and quality | Insights

photocraft Public

Notifications | Fork 11.8k | Star 67.2k

main | Go to file | Code

aiongg Merge pull request #... 56dbc89 · 30 minutes ago

.cargo	one-shot	3 weeks ago
.config	ci: integrate current m...	3 days ago
.github	CI: run panic_hunt in t...	yesterday
apps	Merge pull request #7...	3 hours ago
assets	fix(ui): wide ellipse for ...	10 hours ago
book	Composited CMYK do...	last week
contributors	Reject notes.set move...	10 hours ago
crates	Color panel field fills it...	1 hour ago
docs	Merge PR #6364: Path...	3 hours ago
examples/plugins/in...	Sandboxed WebAsse...	2 weeks ago
packaging	Print through CUPS ov...	20 hours ago
perf	GPU memory: discrete...	3 days ago
scorecard	File > Save As / Save a ...	4 days ago
scripts	Layered TIFF: open an...	2 weeks ago
xtask	Print through CUPS ov...	20 hours ago
.dockerignore	Self-host the web app ...	last week
.git-blame-ignore-revs	Ignore the workspace ...	2 weeks ago

About

PhotoCraft: An open-source, photo editor written by scratch in pure Rust

getartcraft.com/apps/phot...

art | image-editing | image-editing-software | image-editor | images | photo-editing | rust

Readme

Apache-2.0, MIT licenses found

Contributing

Security policy

Activity

Custom properties

67.2k stars

289 watching

11.8k forks

Report repository

Releases 12

PhotoCraft v0.10.0 Latest
14 hours ago

+ 11 releases

Contributors 307

.gitignore	macOS DMG: branded...	last week
AGENTS.md	CI: fix the tests that ke...	3 days ago
ATTRIBUTION.md	fix(ui): wide ellipse for ...	10 hours ago
Cargo.lock	Release 0.10.0 (#7192)	16 hours ago
Cargo.toml	Release 0.10.0 (#7192)	16 hours ago
Dockerfile	Self-host the web app ...	last week
LICENSE-APACHE	Licensing: MIT OR Apa...	2 weeks ago
LICENSE-MIT	Licensing: MIT OR Apa...	2 weeks ago
NOTICE	feat(algo): face detecti...	2 days ago
README.md	Print through CUPS ov...	20 hours ago
ROADMAP.md	Docs: oracle floor, ope...	5 days ago
SECURITY.md	fix(automation): close ...	2 weeks ago
clippy.toml	Never crash: steering ...	2 weeks ago
rustfmt.toml	Format: adopt the craf...	2 weeks ago

README Contributing Apache-2.0 license More

ARTCRAFT

PhotoCraft

Image editing; an open-source, clean-room reimplementation of Adobe Photoshop, rebuilt in pure Rust.

Layers, masks, adjustment layers, layer styles, type, vectors, brushes and real PSD files,
in a native app written entirely in Rust. Open source, offline, and yours.

100% Rust | macOS · Windows · Linux · FreeBSD · Web native | license MIT / Apache-2.0 | status early alpha

JOIN US ON DISCORD

PhotoCraft on getartcraft.com · ArtCraft · All Crafting Apps

+ 293 contributors

Languages

Rust 99.5%	**Shell** 0.2%
WGSL 0.2%	**PowerShell** 0.1%
Python 0%	**HTML** 0%

A caption card with a drop shadow, live type, and Vibrance and Curves adjustment layers, with the Curves editor open.

The Great Wave off Kanagawa, Katsushika Hokusai, c. 1831

> **Note**
>
> **ArtCraft is a community of artists from all walks of life.** Digital, generative, music, games — if you make things, you're one of us. **Come say hi on Discord.**

Features · Everything in the box · PSD · Agents · Under the hood · Get started · Downloads · Crafting Apps · Discord

🎛️ Familiar by design

The menus, shortcuts, panels and tools are where your hands expect them, from ⌘J to ⇧⌘D. If you know Photoshop, you already

⚡ Native and fast

A GPU compositor on wgpu (Metal, Vulkan, DX12, WebGPU), copy-on-write tiles and multithreaded filters. No Electron, no web view, no waiting.

🗂️ Real PSD files

Open, edit and save layered Photoshop documents. Re-saving keeps the render of 307 of the 309 psd-tools test files.

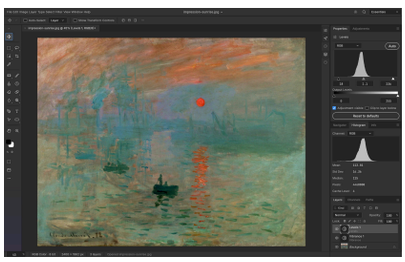
🤖 Agent-ready

Every action is a command so you car drive the same engine from the UI, the CLI, a JSON control channel or an MCP server.

know PhotoCraft.			

Features

Every screenshot here is the real app at work on public-domain art, rendered offscreen through its control channel.

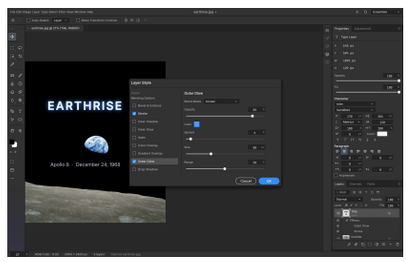


Levels and Vibrance adjustment layers, with the live Histogram panel.
Impression, Sunrise, Claude Monet, 1872

Edit without regret

Adjustment layers keep every edit live. Stack Levels, Curves, Vibrance, Hue/Saturation and a dozen more, mask them to an area, reorder them, or turn them off, and your original pixels never change.

16 adjustment layers that also apply directly to pixels, including Curves with per-channel editing, Levels with a live histogram, Black & White, Channel Mixer, Gradient Map, Photo Filter, Selective Color and Color Lookup (.cube, .3dl, .look). Plus Shadows/Highlights, Replace Color, Match Color, HDR Toning, Desaturate and Equalize.

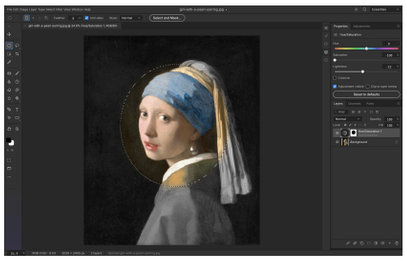


Outer Glow and Stroke on a live type layer, in the Layer Style dialog.
Earthrise, William Anders / NASA, 1968

Styles that sell the shot

Drop Shadow, Inner Shadow, Outer and Inner Glow, Bevel & Emboss, Satin, Stroke, and Color, Gradient and Pattern Overlay, live on any layer, including type. Patterns come from a library (built-ins, Edit › Define Pattern, `.pat` import/export) and PSD `Patt` blocks.

Copy and paste styles between layers, hide all effects at once, and open styles straight from your PSDs, rendered to match Photoshop.



An elliptical selection becomes the mask of a Hue/Saturation layer, so only the face keeps its color.
Girl with a Pearl Earring, Johannes Vermeer, c. 1665

Selections that understand your image

Marquees, lassos and the Magic Wand for precision; Quick Selection, Object Selection and Select Subject when you want the computer to do the tracing; Select and Mask to refine hair-fine edges.

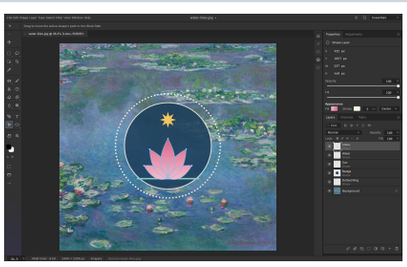
Feather, expand, contract, smooth, grow, reselect. Turn any selection into a layer mask, a vector path or a shape. Smart selection runs on your machine, with no cloud and no account.

A headline edited in place, with a byline and a paragraph of body text.
Among the Sierra Nevada, California, Albert Bierstadt, 1868

Type that sets beautifully

Point and paragraph text, edited right on the canvas, with full Character and Paragraph controls: font, weight, size, leading, tracking, alignment and colour. The full Type Color Picker also supports screen sampling with a pixel loupe.

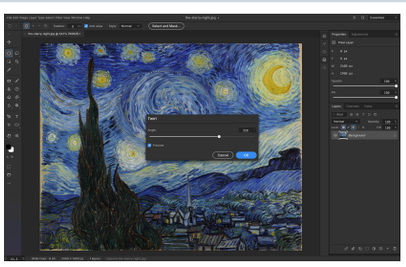
Type layers stay editable, take layer styles, and round-trip through PSD.



A badge made of shape layers: a gradient-filled lotus, a star and a dotted ring.
Water Lilies, Claude Monet, 1906

Pixel-perfect vectors

Rectangle, Ellipse,



Twirl previews live on the canvas, only inside the selection.
The Starry Night, Vincent van Gogh, 1889

See it before you commit

Every filter dialog

Triangle, Polygon, Line and the Pen, Freeform Pen and Curvature Pen tools, with resolution-independent shape layers, gradient fills, and dashed, aligned strokes.

Combine shapes (unite, subtract, intersect, exclude), keep paths in the Paths panel, use them as vector masks, or stroke and fill them. 116 of 116 shape layers in our PSD corpus match Photoshop's pixels.

Free Transform on a rotated print, with every step listed in History. *The Tetons and the Snake River*, Ansel Adams, 1942

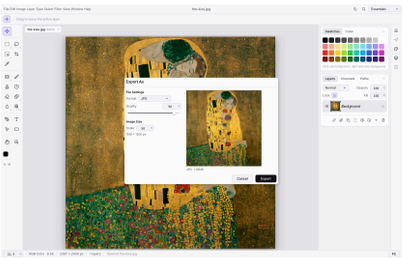
Shape it any way you like

Free Transform with scale, rotate, skew, distort and perspective; exact 90° and 180° rotations and flips;

previews live on the canvas, through your selection. Blurs (Gaussian, Box, Motion, Radial, Surface, Smart, Lens, Shape, and the Blur Gallery: Tilt-Shift, Iris, Field, Spin, Path), sharpening, Reduce Noise, distortions (Twirl, Wave, Ripple, Displace, Shear, Zig Zag…), Pixelate, Stylize (Oil Paint, Wind, Extrude…), Render (Clouds, Fibers, Lens Flare, Lighting Effects) and more.

Run filters on a smart object and they stay editable: change, hide, reorder or mask them at any time.

Large-radius blurs use running-sum box passes across all cores: a radius-180 Gaussian on 3.6 MP takes under a second.



Export As in the light theme, with a preview and a file-size estimate. *The Kiss*, Gustav Klimt, 1907–1908

Ship it anywhere

Export As with format, quality, transparency and scale, plus a preview and an instant file-size estimate. Quick Export to PNG in one click.

Transform Again. Layers, type, shapes, masks and selections all transform together. Full history, Toggle Last State and the History Brush mean every step can be undone, even one brush stroke at a time.	Choose a dark Pro theme, the airy Studio themes, or a Classic look.

Everything in the box

🧰 **67 tools**	🖌️ **A real brush engine**	🗃️ **Layers, done properly**
Move · Artboard · Rectangular and Elliptical Marquee · Single Row Marquee · Single Column Marquee · Lasso · Polygonal Lasso · Magnetic Lasso · Object Selection · Quick Selection · Magic Wand · Crop · Perspective Crop · Slice · Slice Select · Frame · Eyedropper · Color Sampler · Ruler · Note · Count · Remove · Spot Healing Brush · Healing Brush · Patch · Content-Aware	Shape Dynamics, Scattering, Texture, Dual Brush, Color Dynamics, Transfer, Brush Pose, Wet Edges, Build-up and Smoothing (including Pulled String), driven by pen pressure, tilt, rotation and direction. Brush presets, Define Brush from Selection, and deterministic, replayable strokes.	Groups, clipping masks, pixel and vector masks, fill layers (solid, gradient and pattern), adjustment layers, live smart objects with smart filters and lossless transforms and warps, multi-layer selection with align, distribute and link, alpha channels and Quick Mask, 27 Photoshop blend modes plus six Paint.NET variants, opacity and fill, locks, colour labels, a

Move · Red Eye · Brush · Pencil · Mixer Brush · Color Replacement · Clone Stamp · Pattern Stamp · History Brush · Eraser · Background Eraser · Magic Eraser · Gradient · Paint Bucket · Blur · Sharpen · Smudge · Dodge · Burn · Sponge · Pen · Freeform Pen · Curvature Pen · Add Anchor Point · Delete Anchor Point · Convert Point · Horizontal and Vertical Type · Horizontal and Vertical Type Mask · Path Selection · Direct Selection · Rectangle · Ellipse · Triangle · Polygon · Line · Custom Shape · Hand · Rotate View · Zoom		layer kind filter, merge, flatten, rasterize, Layer via Copy/Cut, Paste Into.
🎨 Any colour, any depth	**🗂️ Formats** PSD and PSB,	**🪄 The everyday essentials**

RGB, Grayscale, CMYK and Lab documents at 8, 16 and 32 bits per channel. Bit depth and colour model are runtime data, so every tool works at every depth. Real ICC colour management in pure Rust: embedded profiles, Assign and Convert to Profile with all four rendering intents and black point compensation, soft proofing (⌘Y) and Gamut Warning (⇧⌘Y) on the GPU.	layered TIFF (Photoshop's layer data in the TIFF, read and written in either byte order), Paint.NET PDN3 (read, with editable layers and all 14 blend modes), OpenRaster (read and write, with layers, groups and blend modes, for Krita, MyPaint and GIMP), Krita .kra (read, with paint layers, groups, blend modes and transparency masks), SVG (opens as shape layers, places as a vector Smart Object), plus flat PNG, JPEG, TIFF, WebP (lossy and lossless), GIF, BMP, TGA, ICO, QOI, PNM, OpenEXR, Radiance HDR and FITS (astronomy images: 8/16-bit and 32-bit float, gray or RGB, header kept), and the native `.pcraft` format. Flat formats retain the depths they	Auto Tone, Contrast and Color · Equalize · Image and Canvas Size · Crop and Trim · Reveal All · Edit › Fill and Stroke · Copy Merged · Paste in Place · guides, rulers, grid and snapping · Actions record and replay · a command palette (⌘F).	

support: PNG keeps 8/16-bit samples, TIFF keeps 8/16-bit and 32-bit float samples, and OpenEXR keeps half/float samples; JPEG, WebP and the other 8-bit formats reduce higher-depth samples with an export warning. See the [codec capability matrix] for each format. HEIC photos from iPhone and Mac are read-only (included in official builds; optional `--features heif` for source builds). AVIF is write-only with the optional `avif` build feature; AVIF decoding and JPEG XL are unavailable. Affinity documents (`.af` , `.afdesign` , `.afphoto` , `.afpub`) open natively, read only, with artboards, layers, vectors, text, images and masks;

	effects, adjustments and other unsupported parts are listed in a warning, and Affinity export is unavailable.	

PSD without compromise

PhotoCraft's PSD support is a standalone crate written from Adobe's public specification and tested against a corpus of real-world files.

- **Faithful round trips:** opening and re-saving a document renders the same for 307 of the 309 files in the psd-tools test set and 169 of 170 in our mixed ag-psd/psd-tools set (`crates/io/tests/corpus.rs` ; fetch the psd-tools set with `cargo xtask corpus --psd-tools`), and anything we don't model yet (raw blocks, descriptors, extras) is carried over instead of being dropped. A re-saved file is not byte-identical to its source: PhotoCraft rewrites image resources, layer records and the composite. Only the standalone `photocraft-psd` crate, parsing and writing a file without the document model, reproduces every parseable corpus file byte for byte (`crates/psd/tests/corpus.rs`).
- **Pixels that match:** a composite oracle compares our render with Photoshop's own merged image, covering gradient interpolation (Classic, Perceptual and Linear), layer effects, shape strokes, clipping and fill opacity.
- **Large documents:** PSB, 16 and 32-bit files, and CMYK and Lab documents open natively.

Built for agents

Every menu item, tool and dialog runs a command from one registry of 500+ commands. The UI, the CLI, the JSON control channel and the MCP server all call the same commands, so anything you can click, a script or an AI agent can do too.

```
# Headless: open, edit, save
photocraft-cli run wave.psd \
  --cmd filter.sharpen.smartSharpen     --params
  --cmd layer.newAdjustmentLayer.curves --params
  --out wave-final.png

# Apply one action list to a folder of images
photocraft-cli batch --actions grade.json --in ./

# Every subcommand explains itself
photocraft-cli batch --help

# Let an agent drive it over MCP (headless, or b
photocraft-cli mcp
```

The desktop app also offers an authenticated, loopback-only control channel (`photocraft --control`) for inspecting UI state, driving tools with pointer events, and taking offscreen screenshots. Every image in this README was rendered that way. See docs/control-protocol.md .

Under the hood

- **Engine first:** a pure-data document model and a command engine, with a thin egui UI on top. Layering is enforced at build time across 24 crates.
- **Two compositors:** a CPU compositor serves as the reference oracle, and a wgpu compositor puts the canvas on the GPU. They are tested against each other.
- **Copy-on-write tiles:** 256^2 sparse tiles make undo cheap and huge canvases light, and effect maps are cached per layer state.
- **Runs in the browser:** the whole engine and UI compile to WebAssembly.
- **Clean-room:** implemented from public specs and observed behaviour only. No proprietary code, shaders or assets.
- **Tested:** more than 1,700 tests, including PSD round trips, synthetic generators, compositor oracles and multi-depth checks.

Get started

```
git clone https://github.com/storytold/photocraft
cd photocraft
cargo run --release -p photocraft -- image.psd
cargo test --workspace
```

Japanese fonts for the UI and Type tool come from craft-fonts, an optional build input (desktop release builds always include it). Without it PhotoCraft uses your system's CJK fonts:

```
git clone https://github.com/storytold/craft-fon
CRAFT_FONTS_DIR="$PWD/../craft-fonts" cargo run
```

New contributors and AI agents: start with `AGENTS.md`, then `docs/`.

Installers for macOS, Windows, Linux, FreeBSD and the web are attached to each GitHub release. On Linux you can pick an AppImage, a `.deb`, an `.rpm`, a tarball or a Flatpak bundle. The bundle needs the freedesktop runtime from Flathub, which `flatpak` offers to install along with it:

```
flatpak install --user photocraft-<version>-linu
flatpak run ai.storyteller.photocraft
```

The Flatpak prints through the host's CUPS socket (File › Print talks IPP to it directly, no `lp` needed); without CUPS, or without a printer, File › Print opens the system print dialog through the print portal. See printing.

The AppImage needs no install: the first run registers its launcher icon and menu entry in `~/.local/share` so the dock shows PhotoCraft's icon on Wayland. Set `PHOTOCRAFT_NO_DESKTOP_INTEGRATION=1` to skip that, and see `docs/releasing.md` › Linux to undo it.

On a Wayland session, files dropped on the window don't open yet: winit 0.30, the windowing library under egui, has no Wayland drag and drop (#386). Use File › Open, or copy the image in your file manager and paste it with Ctrl+V. To drag and drop, start PhotoCraft under XWayland: `WAYLAND_DISPLAY= photocraft`, `WAYLAND_DISPLAY= ./photocraft-<version>-linux-x86_64.AppImage`, or `flatpak run --nosocket=wayland --socket=x11 ai.storyteller.photocraft`. On Wayland, PhotoCraft shows the command for your install in a notice until you dismiss it. Preferences › Performance › Linux display server = X11 does the same on every launch. With a fractional display scale (125%, 150%, 175%) an XWayland window is drawn at a lower resolution and enlarged by the compositor, so the interface is blurred there; native Wayland stays sharp

(#1072).

On macOS, the command-line tool comes as `photocraft-cli-<version>-macos-universal.zip`. The binary is signed with the same Developer ID as the app and notarized by Apple. A bare binary can't carry a stapled notarization ticket the way the DMG does, so the first time you run it macOS checks the notarization online. You can confirm it yourself:

```
ditto -x -k photocraft-cli-<version>-macos-unive
spctl --assess --type install -vv photocraft-cli
# ... accepted, source=Notarized Developer ID
```

On FreeBSD 14 (x86_64), the release has a tarball laid out like `/usr/local`. Install the runtime libraries, then unpack it there:

```
pkg install libxkbcommon wayland libX11 libXcurs
tar -xzf photocraft-<version>-freebsd-x86_64.tar
photocraft
```

Maintainers: `docs/releasing.md` explains how releases are built, signed and published.

> **Important**
>
> **Status:** PhotoCraft is in early alpha, and we want to be straight about where it stands: much of Photoshop's feature surface exists in some form, but **it is not yet a Photoshop replacement for daily professional work**. The biggest gaps are AI/generative features, 15 missing tools, depth in typography and pro workflows, and plug-in compatibility. Every Photoshop menu item is wired to a command (`docs/parity-checklist.md`), but that measures wiring, not behaviour. The honest, dimension-by-dimension picture and where we're going next are in the roadmap and parity assessment. Expect rough edges, and please file issues (include your OS, document size, layer count and a screenshot). You can also tell us what broke on Discord.

Community packages

These installers are maintained by community members, not by the PhotoCraft team.

On Gentoo, the ::snakebyte overlay packages the Linux release as `media-gfx/photocraft-bin`:

```
eselect repository add snakebyte git https://gitl
emaint sync -r snakebyte
echo 'media-gfx/photocraft-bin ~amd64' >> /etc/p
emerge --ask media-gfx/photocraft-bin
```

Documentation

Developer, architecture, automation, format, and security documentation is maintained in the PhotoCraft documentation book.

To self-host the browser version with Docker, see Docker web hosting.

Security

Security architecture, threat modeling, parser hardening, fuzzing, and vulnerability reporting are covered in the security documentation and the repository security policy.

Test corpora

PhotoCraft is tested against real files: our own Photoshop-authored oracle PSDs in photocraft-corpus plus the psd-tools, ag-psd and PngSuite sets, pinned and sha256-verified. Fetch them with `cargo xtask corpus --all` and run the tests with `cargo xtask test-corpus` (details in docs/development.md).

Downloads

New to PhotoCraft? Download it from the PhotoCraft page on getartcraft.com. That's the easiest way to install it.

Want a specific build or format? On GitHub, the latest release has every build listed below, and all releases has earlier versions and their notes. `<ver>` in the file names is the version number, and `SHA256SUMS.txt` lists a checksum for every file.

Windows

Build	Installer	Portable
x64 (64-bit Intel/AMD)	`photocraft-<ver>-windows-x64.msi`	`photocraft-<ver>-windows-x64-portable.zip`
arm64 (Snapdragon and other ARM PCs)	`photocraft-<ver>-windows-arm64.msi`	`photocraft-<ver>-windows-arm64-portable.zip`
x86 (32-bit)	`photocraft-<ver>-windows-x86.msi`	`photocraft-<ver>-windows-x86-portable.zip`

Installers and executables are code-signed.

macOS

Build	File	Notes
App, universal (Apple silicon + Intel)	`photocraft-<ver>-macos-universal.dmg`	Signed and notarized
Command-line tool, universal	`photocraft-cli-<ver>-macos-universal.zip`	Signed and notarized

Linux

Format	x86_64	aarch64 (A
AppImage	`photocraft-<ver>-linux-x86_64.AppImage`	`photocraf <ver>-linu aarch64.Ap`
Flatpak	`photocraft-<ver>-linux-x86_64.flatpak`	`photocraf <ver>-linu aarch64.fl`

Debian/Ubuntu	`photocraft-<ver>-linux-x86_64.deb`	`photocraf <ver>-linu aarch64.de`
Fedora/RHEL/openSUSE	`photocraft-<ver>-linux-x86_64.rpm`	`photocraf <ver>-linu aarch64.rp`
Tarball	`photocraft-<ver>-linux-x86_64.tar.gz`	`photocraf <ver>-linu aarch64.ta`

RISC-V (riscv64): `photocraft-<ver>-linux-riscv64.tar.gz` only, built against Ubuntu 24.04 (needs glibc 2.39+).

FreeBSD

Build	File
x86_64	`photocraft-<ver>-freebsd-x86_64.tar.gz`

Web (WebAssembly)

Build	File	Notes
Static site	`photocraft-web-<ver>.zip`	Runs in a modern browser; host it on any static server

The Crafting Apps

PhotoCraft is one of the **Crafting Apps**: free, open-source creative tools from the ArtCraft team, each written from scratch in Rust and each able to stand on its own.

	App	What it's for	Code	Learn more
	PhotoCraft	**Image editing: layers, masks, type and real PSD files · you are here**	GitHub	Website
	VectorCraft	Vector illustration	GitHub	Website

	FilmCraft	Video editing, color and sound	GitHub	Website
	LightCraft	Photo library and raw development	GitHub	Website
	PdfCraft	Reading, organizing and protecting PDFs	GitHub	Website
	EffectCraft	Motion graphics and visual effects	GitHub	Website
	DesignCraft	Page layout and publishing	GitHub	Website

And **ArtCraft** itself, our AI image and video studio for artists who want real control.

The Crafting Apps share the same conventions: clean-room and pure Rust, native on macOS, Windows and Linux, in the browser via WebAssembly, and fully drivable by agents.

JOIN US ON DISCORD

Come make things with us

Our Discord is where artists of every kind hang out: people who paint, shoot, draw, cut film, set type, and people still figuring out what they like to make. Share what you're working on, ask for help, tell us what's broken, or tell us what you wish these tools could do. Whatever your medium and however long you've been at it, you're welcome here.

discord.gg/artcraft · getartcraft.com · The Crafting Apps · PhotoCraft

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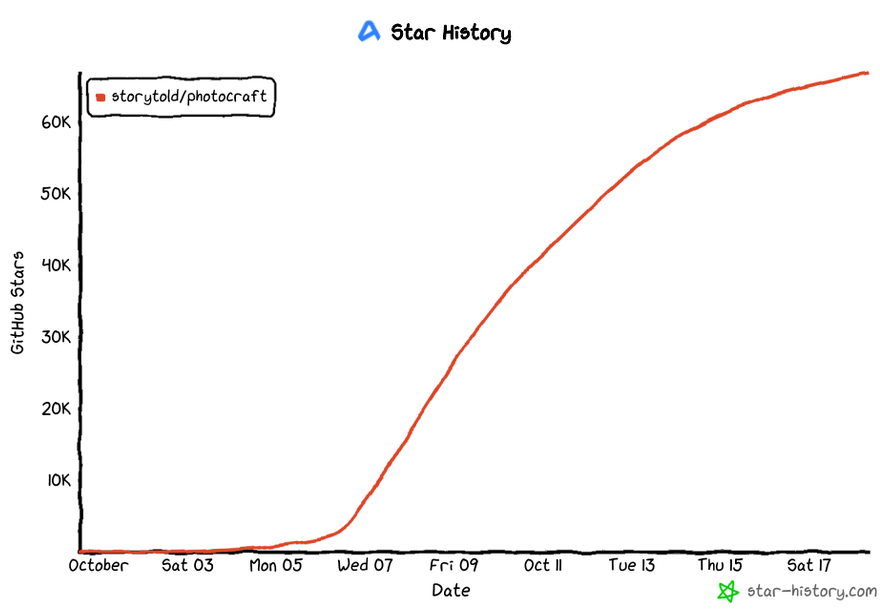
Made by the ArtCraft team and community.

Star history



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